# 2012 RECYCLING NUMBERS

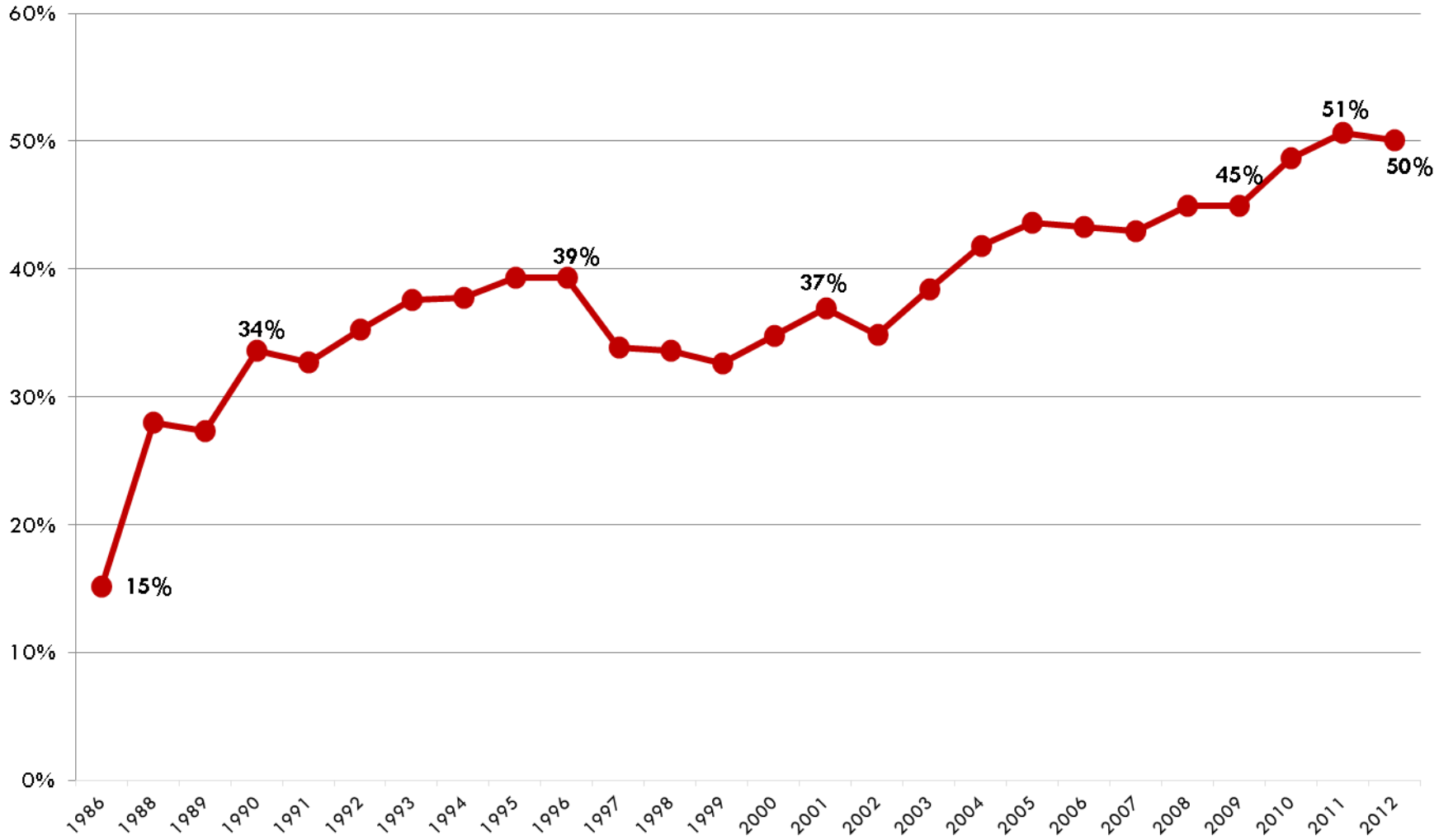
DAN WESTON

W2RAC - March 18, 2014

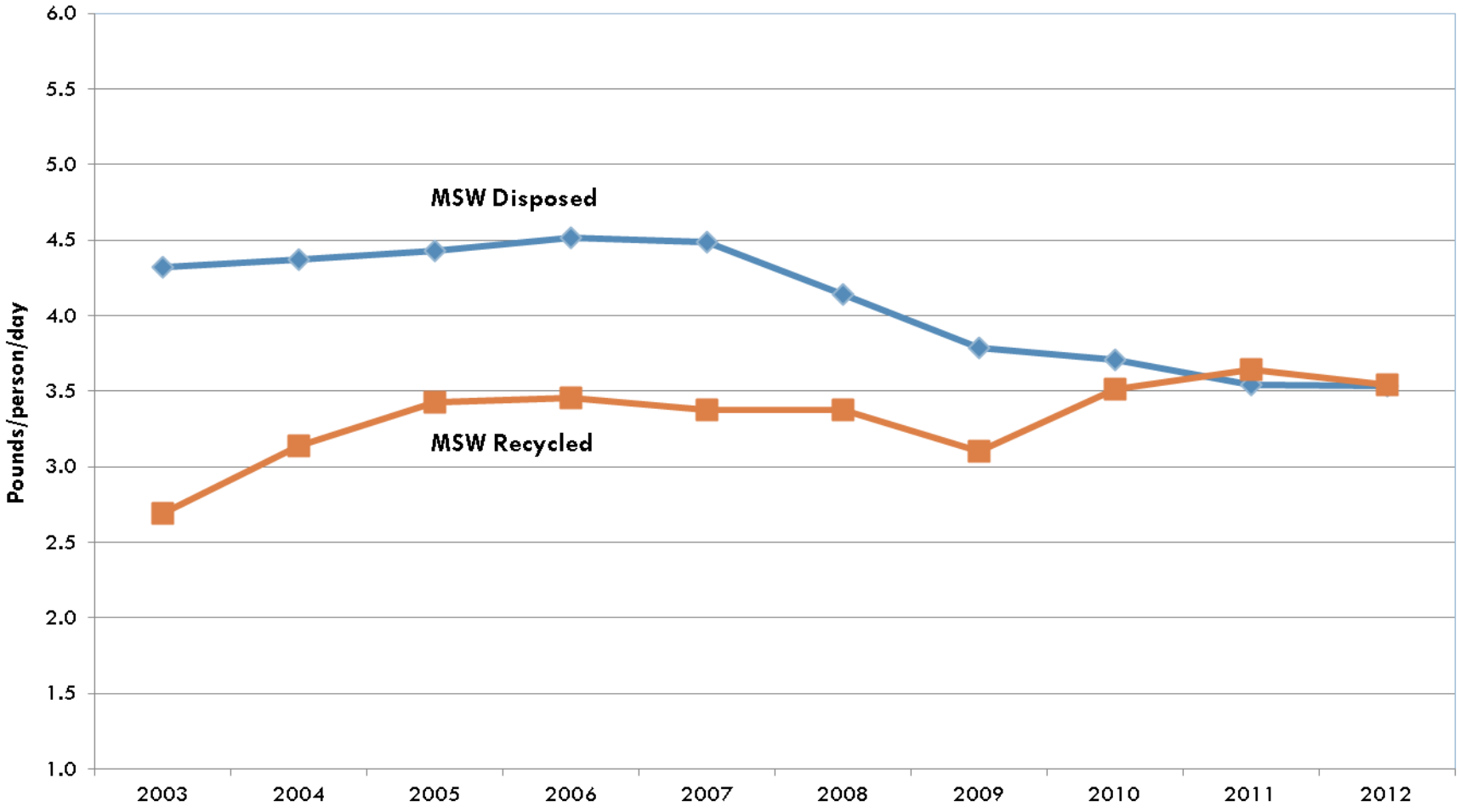
# Methodology

- Annual reports & surveys sent to over 1000 facilities.
- 642 provided recycling data.
- 127 material types consolidated into 64 material categories
- Recycling rate is comprised of 30 MSW materials
- Diversion rate is all 64 materials

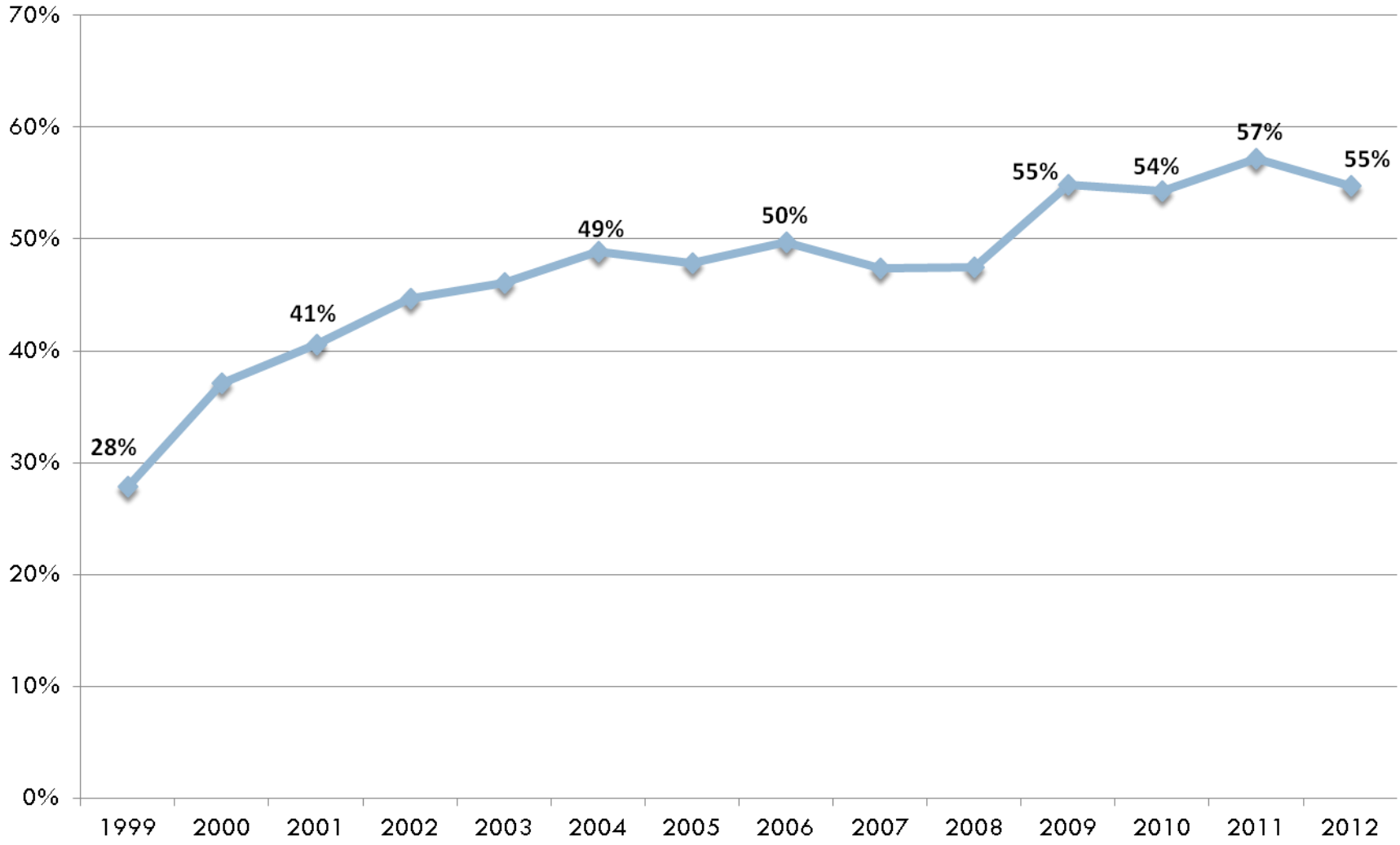
# Recycling Rate



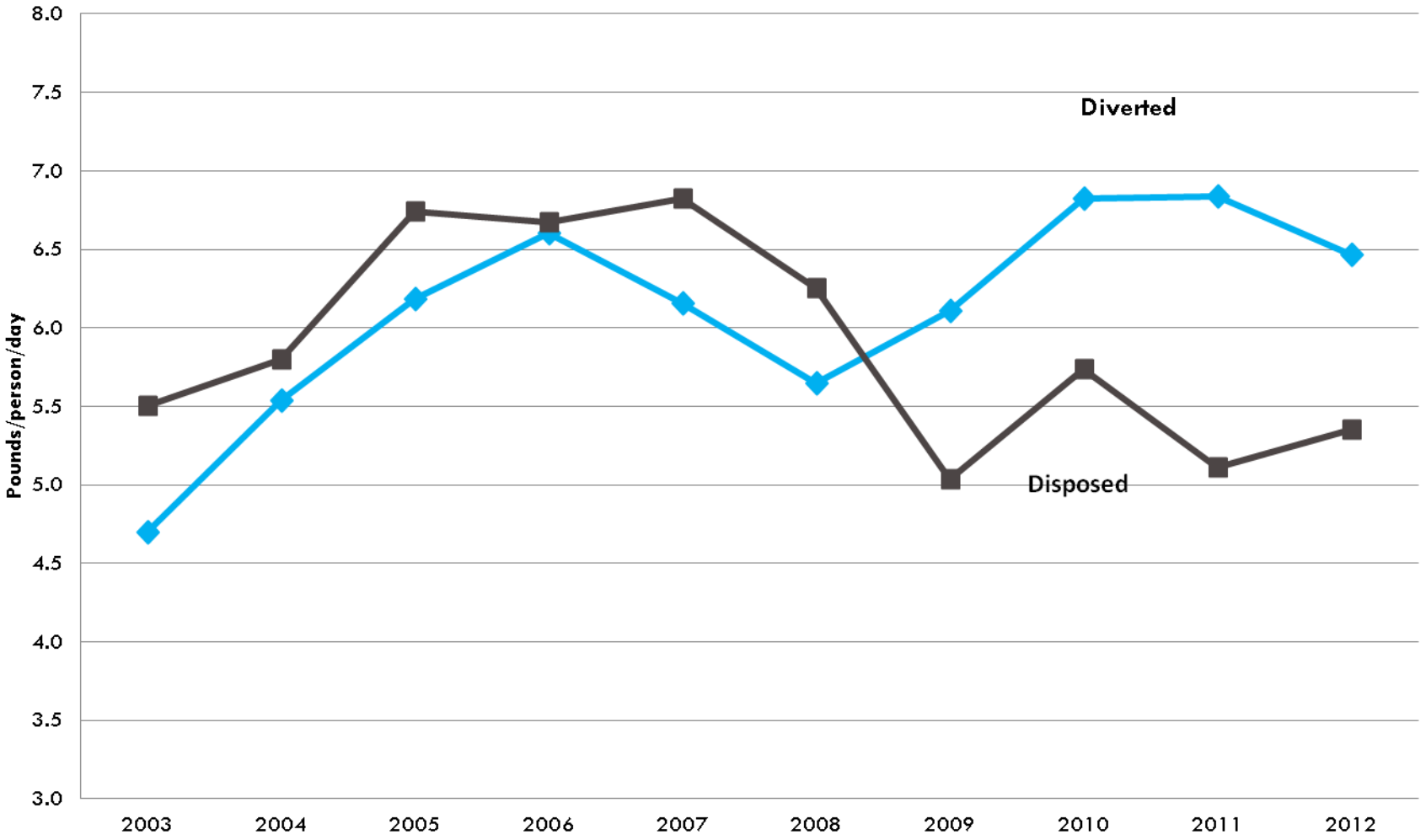
# Per Capita Recycling



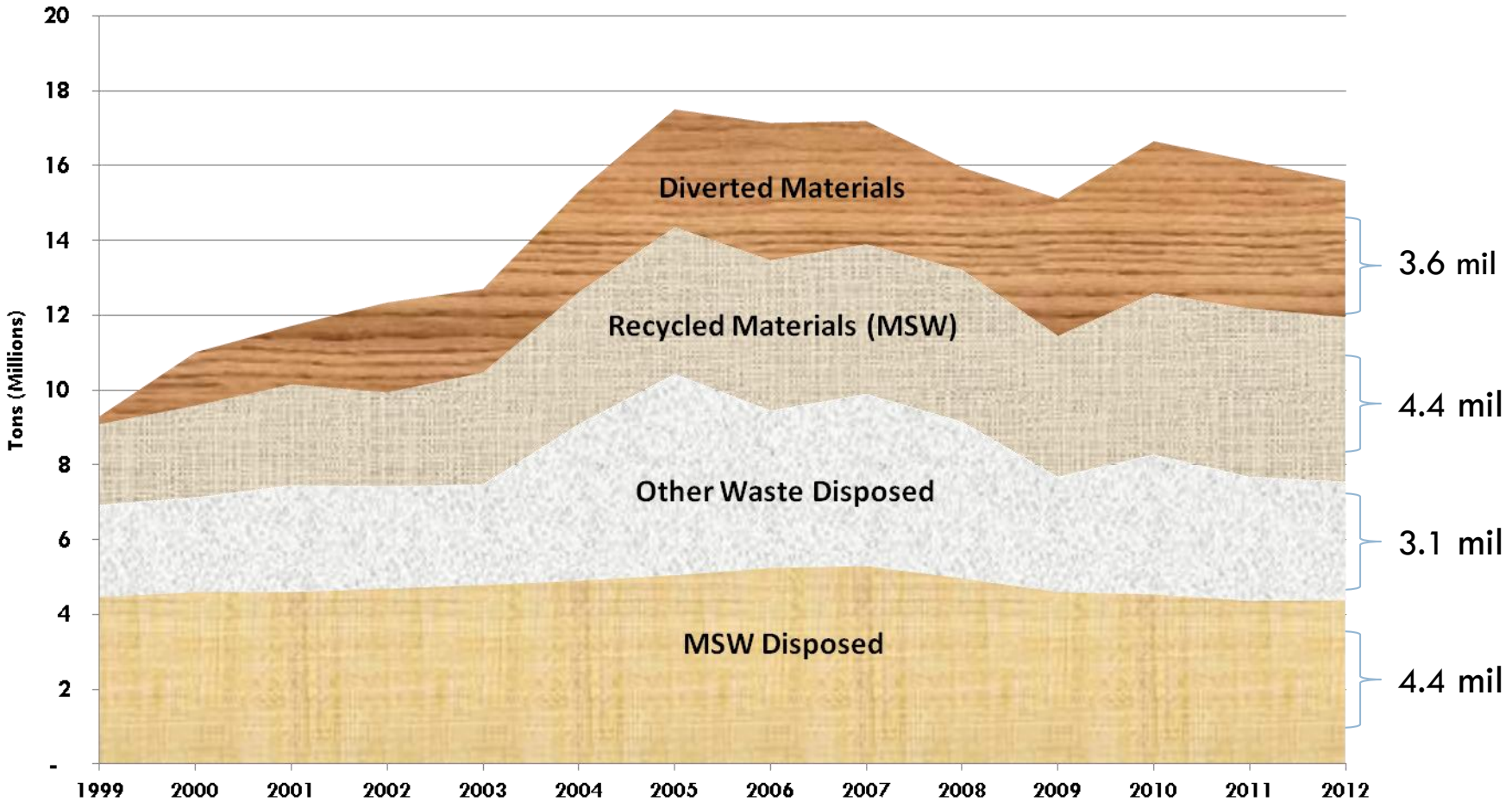
# Diversion Rate



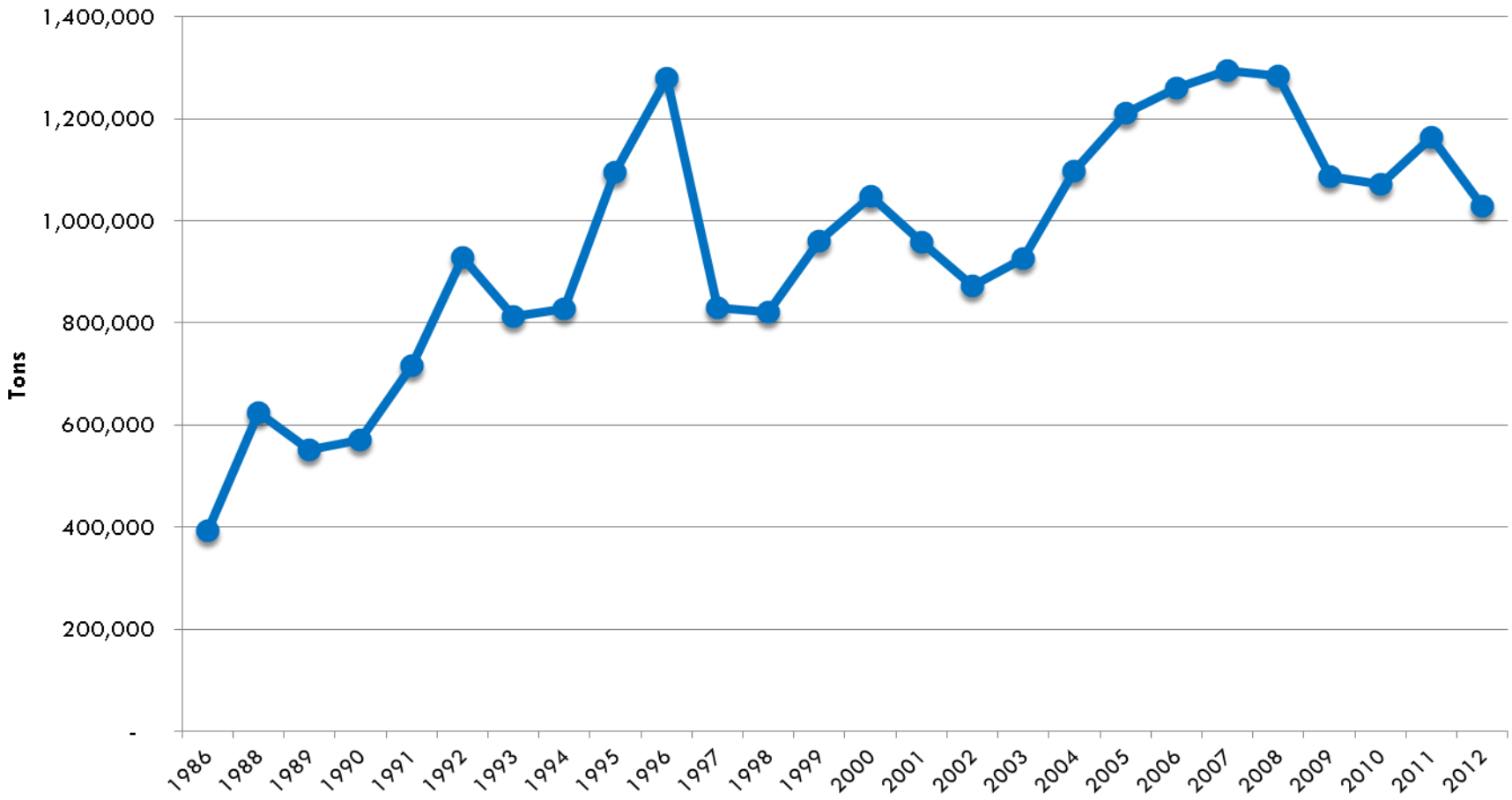
# Per Capita Diversion



# Waste Generation



# Paper


1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
-
Tons
1986
1988
1989
1990
1991
1992
1993
1994
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1996
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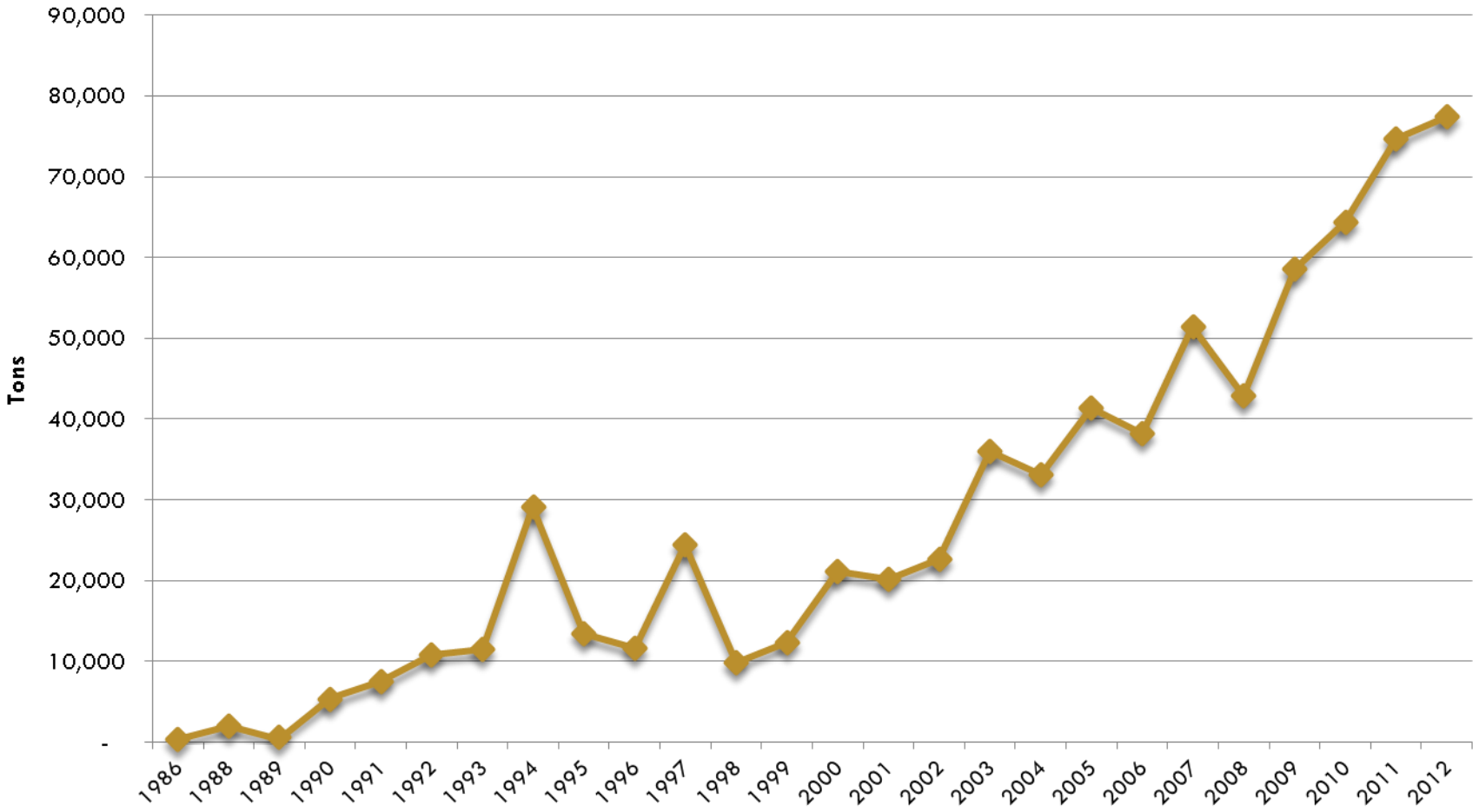
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

# Plastics


Tons
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
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-
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1988
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1992
1993
1994
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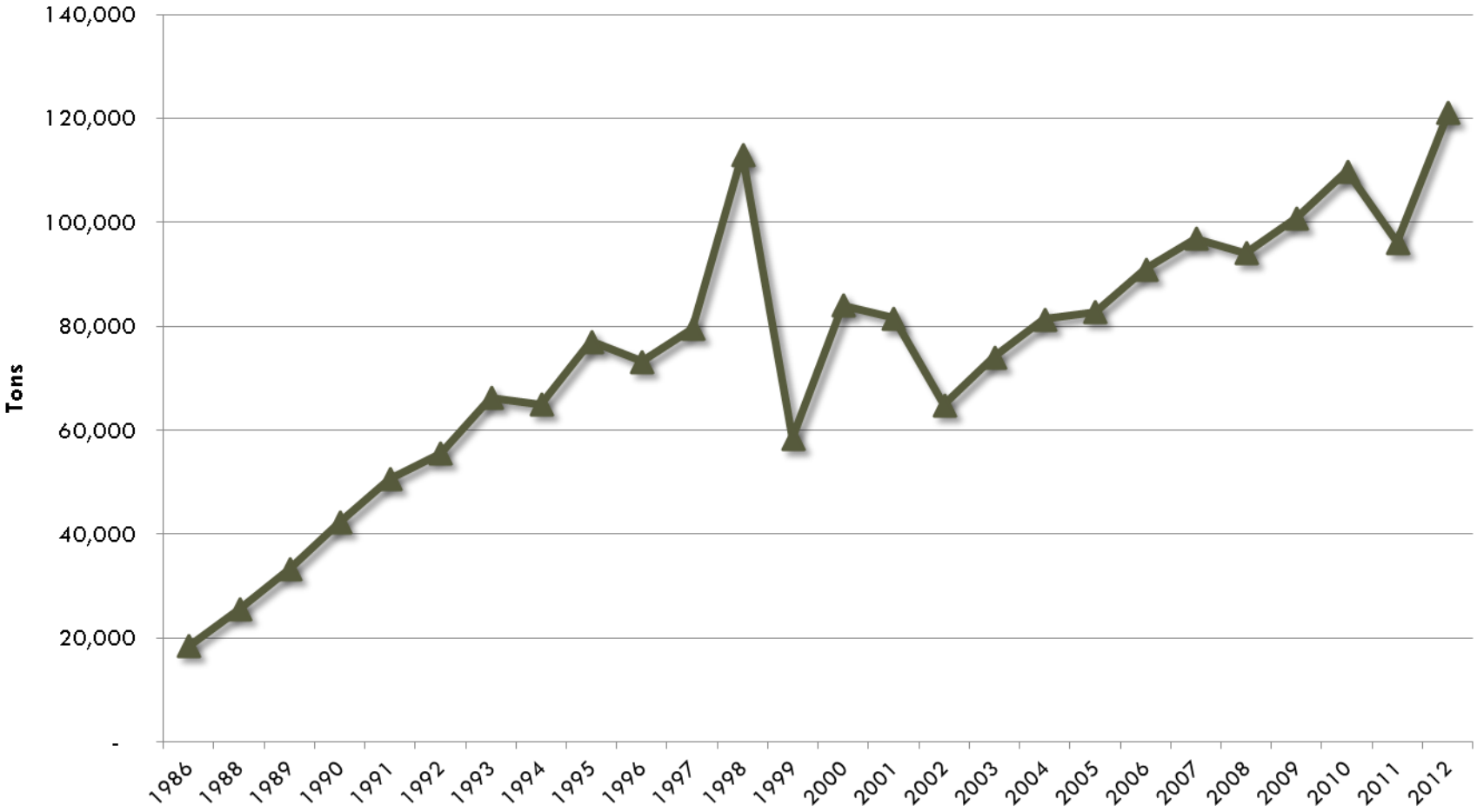
2010
2011
2012

# Glass


140,000
120,000
100,000
80,000
60,000
40,000
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Tons
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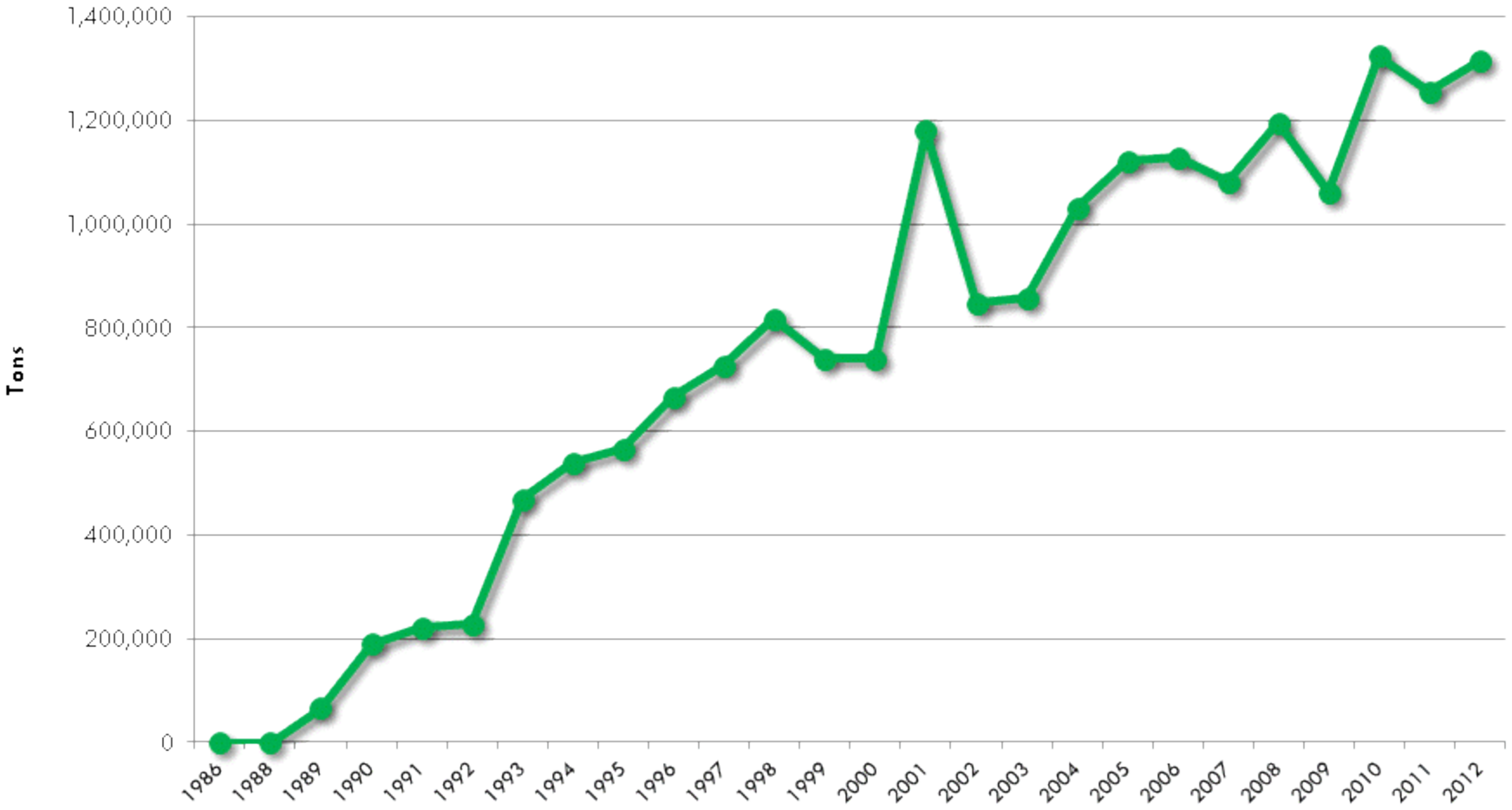
2010
2011
2012

# Organics


Tons
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
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1986
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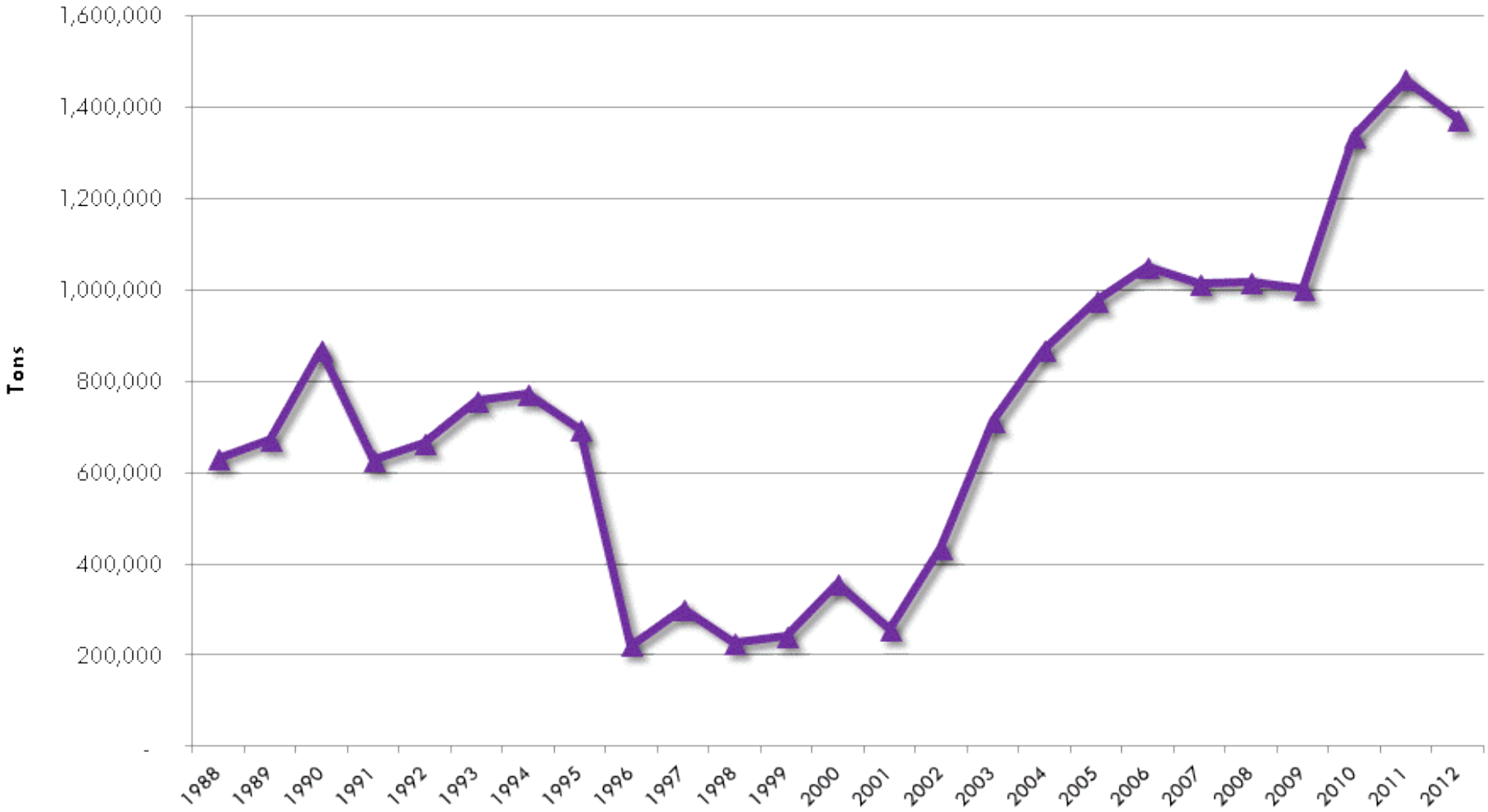
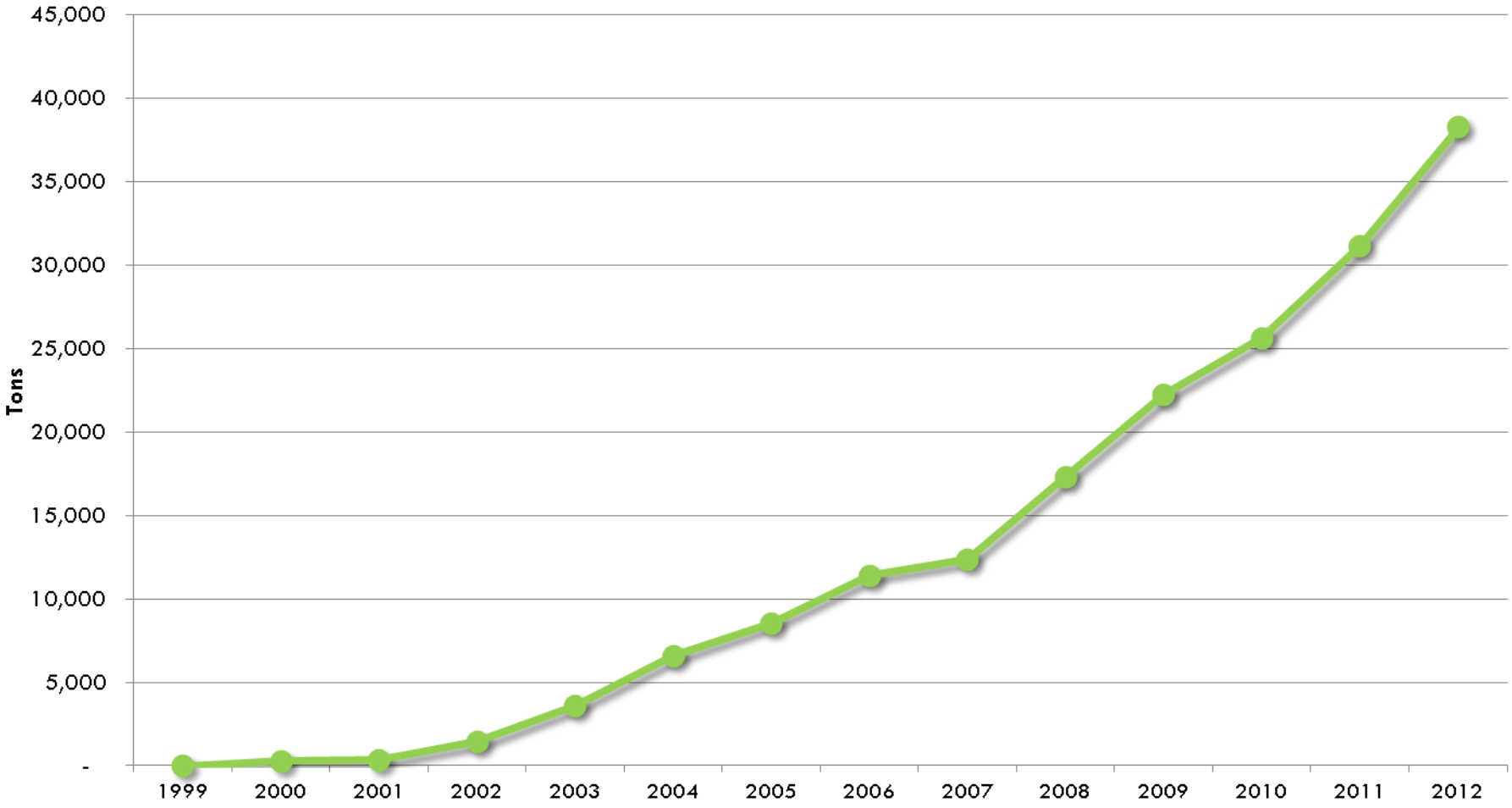
2010
2011
2012

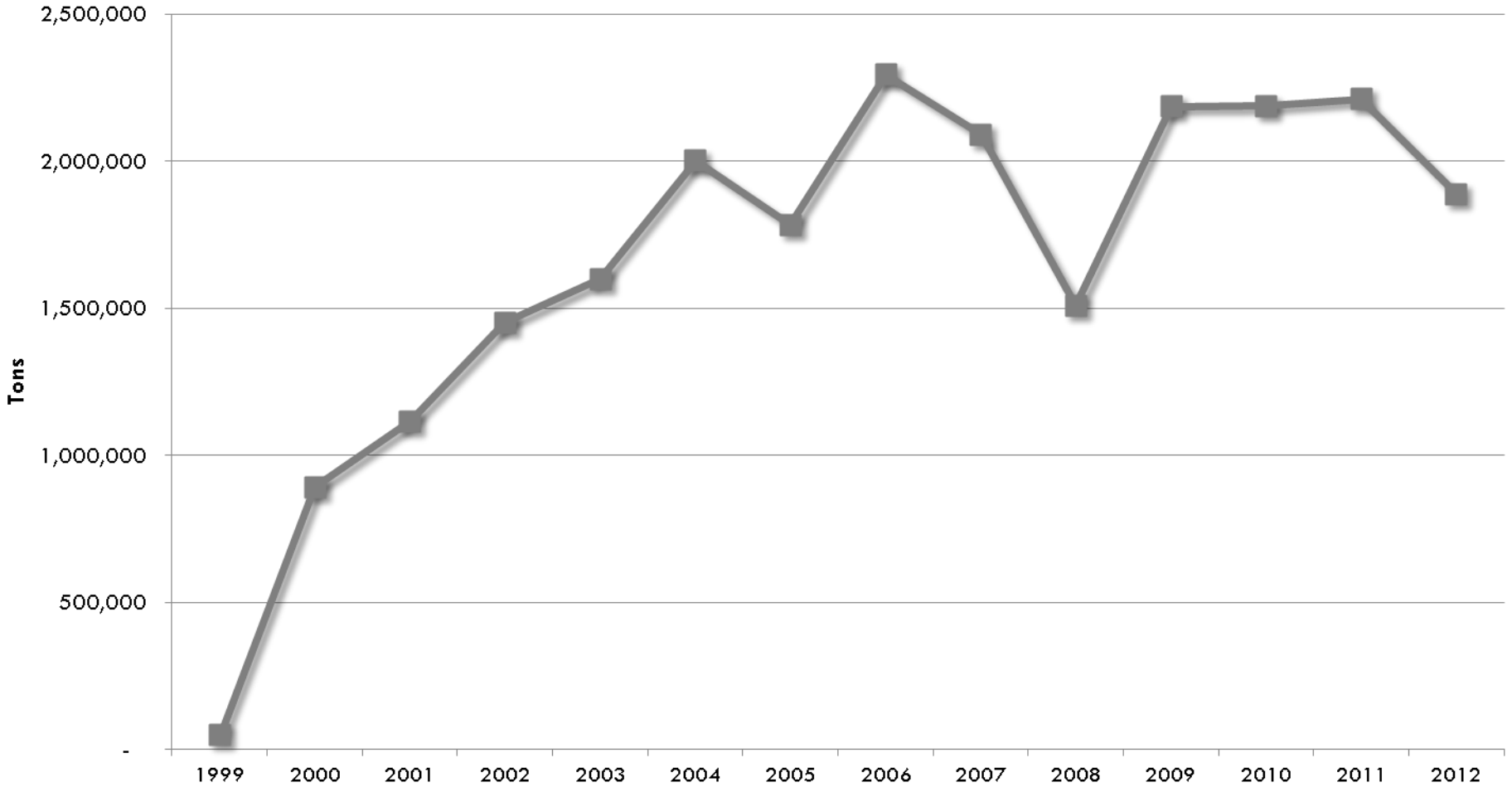
# Ferrous Metals



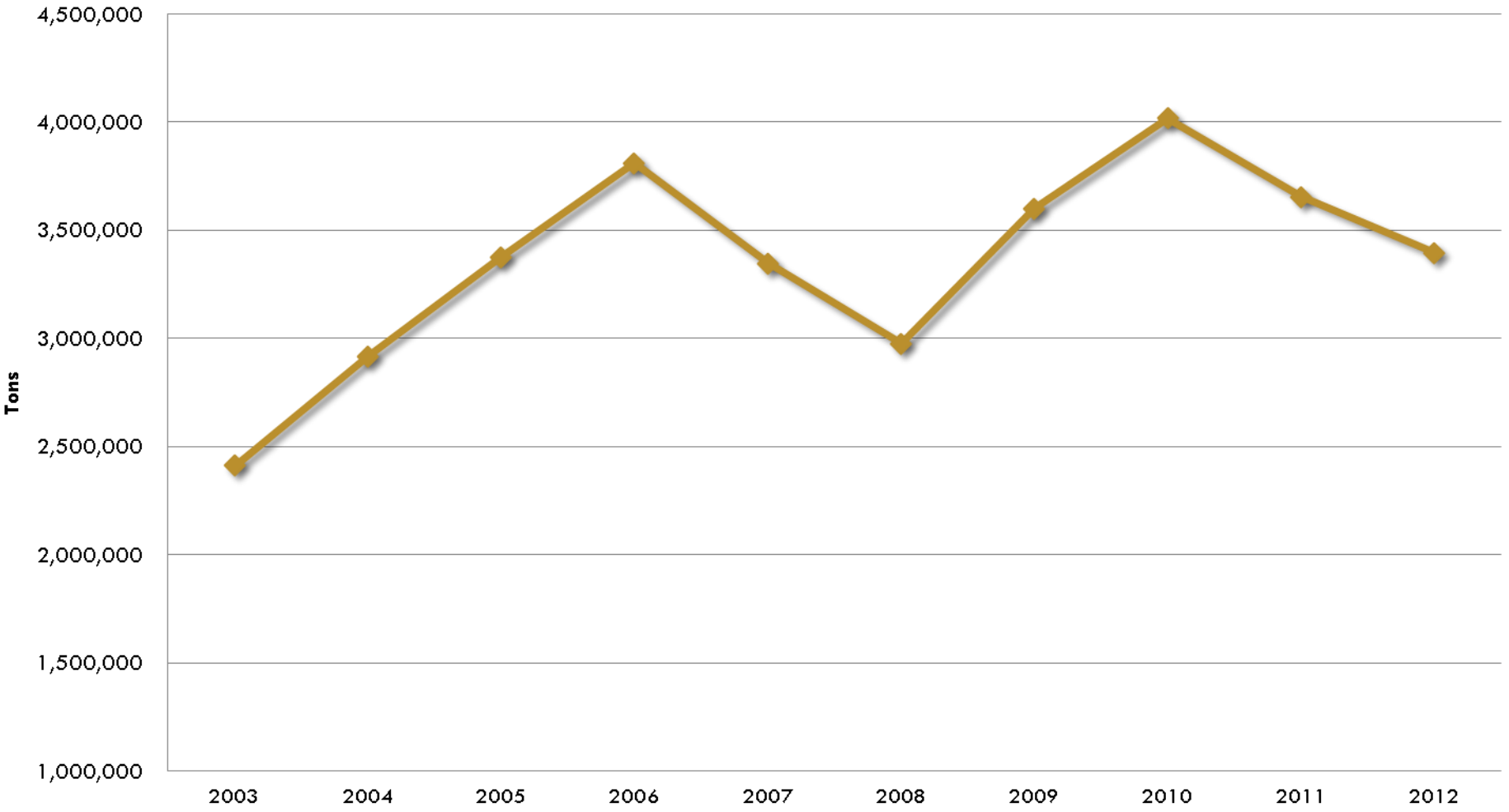
# Electronics



# Asphalt/Concrete



# C & D


4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
Tons
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

# Data Questions?

Gretchen Newman
W2RAC
March 18, 2014

# RECYCLING DESTINATION AND USE STUDY EPA WASTE REDUCTION MODEL (WARM)

# ARE THE RECYCLING RUMORS TRUE?

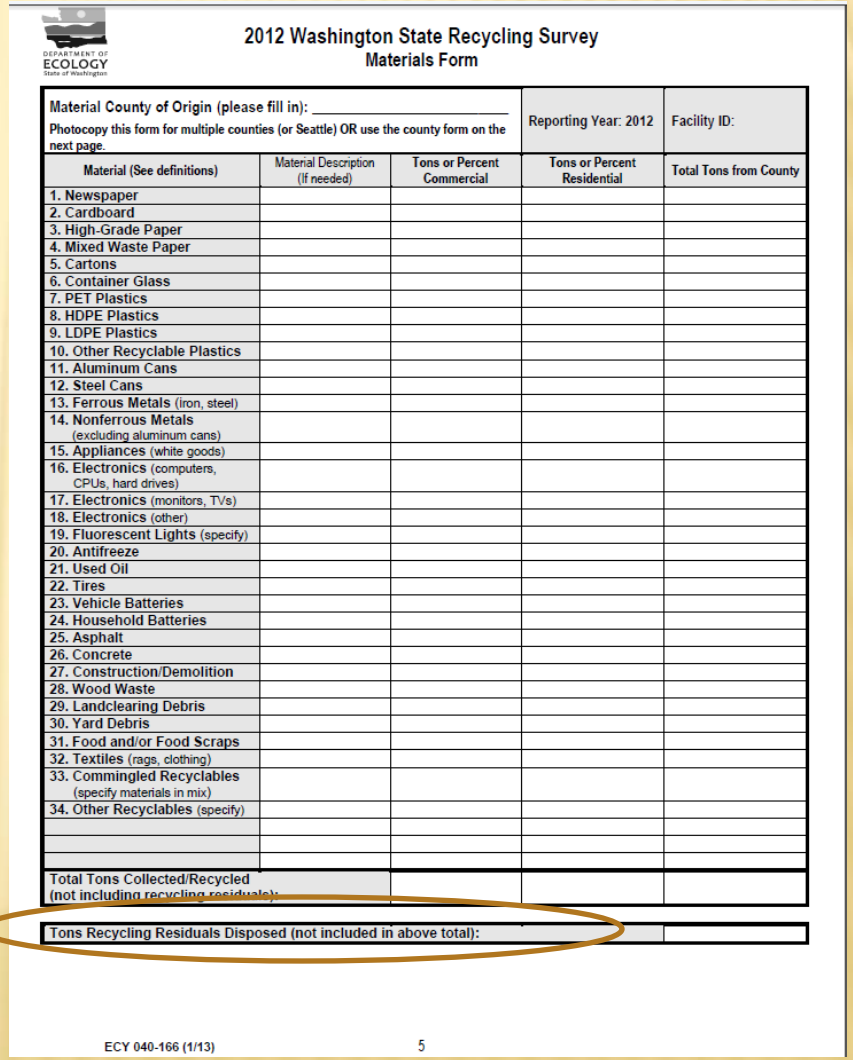
- Is everything recycled that is collected?
- How much is ending up in landfills?
- How concerned should we be?
- Where are recyclables going?
- What are they used for?
- What is *really* going on out there?

# RECYCLING DESTINATION AND USE STUDY (RDUS): GOALS

- Characterize the loss rates, final destination, and use of recyclables collected in WA in 2012.
- Use study results to inform analysis for calculating recycling rate in future years.

# SOURCES OF DATA

- On-line “RDUS” survey
- Residuals disposed data from facility reports (incomplete)
- Destination data from facility reports
- County sampling data
- Other recycling sampling data
- Industry data



DEPARTMENT OF ECOLOGY
State of Washington

**2012 Washington State Recycling Survey**
**Materials Form**

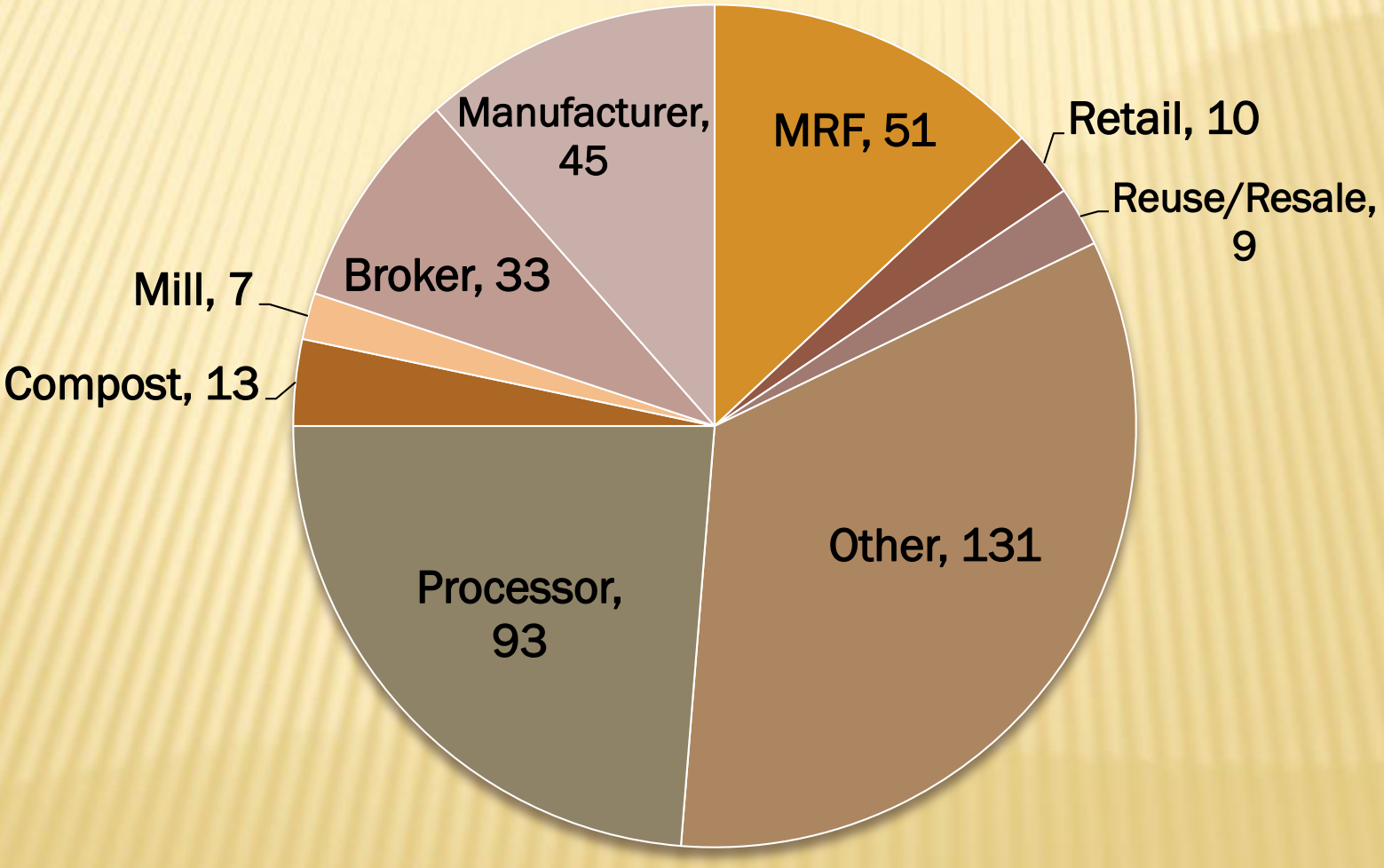
| Material County of Origin (please fill in): _____ Photocopy this form for multiple counties (or Seattle) OR use the county form on the next page. | | | Reporting Year: 2012 | Facility ID: |
|---|---|---|---|---|
| **Material (See definitions)** | **Material Description (If needed)** | **Tons or Percent Commercial** | **Tons or Percent Residential** | **Total Tons from County** |
| 1. Newspaper | | | | |
| 2. Cardboard | | | | |
| 3. High-Grade Paper | | | | |
| 4. Mixed Waste Paper | | | | |
| 5. Cartons | | | | |
| 6. Container Glass | | | | |
| 7. PET Plastics | | | | |
| 8. HDPE Plastics | | | | |
| 9. LDPE Plastics | | | | |
| 10. Other Recyclable Plastics | | | | |
| 11. Aluminum Cans | | | | |
| 12. Steel Cans | | | | |
| 13. Ferrous Metals (iron, steel) | | | | |
| 14. Nonferrous Metals (excluding aluminum cans) | | | | |
| 15. Appliances (white goods) | | | | |
| 16. Electronics (computers, CPUs, hard drives) | | | | |
| 17. Electronics (monitors, TVs) | | | | |
| 18. Electronics (other) | | | | |
| 19. Fluorescent Lights (specify) | | | | |
| 20. Antifreeze | | | | |
| 21. Used Oil | | | | |
| 22. Tires | | | | |
| 23. Vehicle Batteries | | | | |
| 24. Household Batteries | | | | |
| 25. Asphalt | | | | |
| 26. Concrete | | | | |
| 27. Construction/Demolition | | | | |
| 28. Wood Waste | | | | |
| 29. Landclearing Debris | | | | |
| 30. Yard Debris | | | | |
| 31. Food and/or Food Scraps | | | | |
| 32. Textiles (rags, clothing) | | | | |
| 33. Commingled Recyclables (specify materials in mix) | | | | |
| 34. Other Recyclables (specify) | | | | |
| | | | | |
| | | | | |
| | | | | |
| Total Tons Collected/Recycled (not including recycling residuals): | | | | |
| Tons Recycling Residuals Disposed (not included in above total): | | | | |

ECY 040-166 (1/13) 5

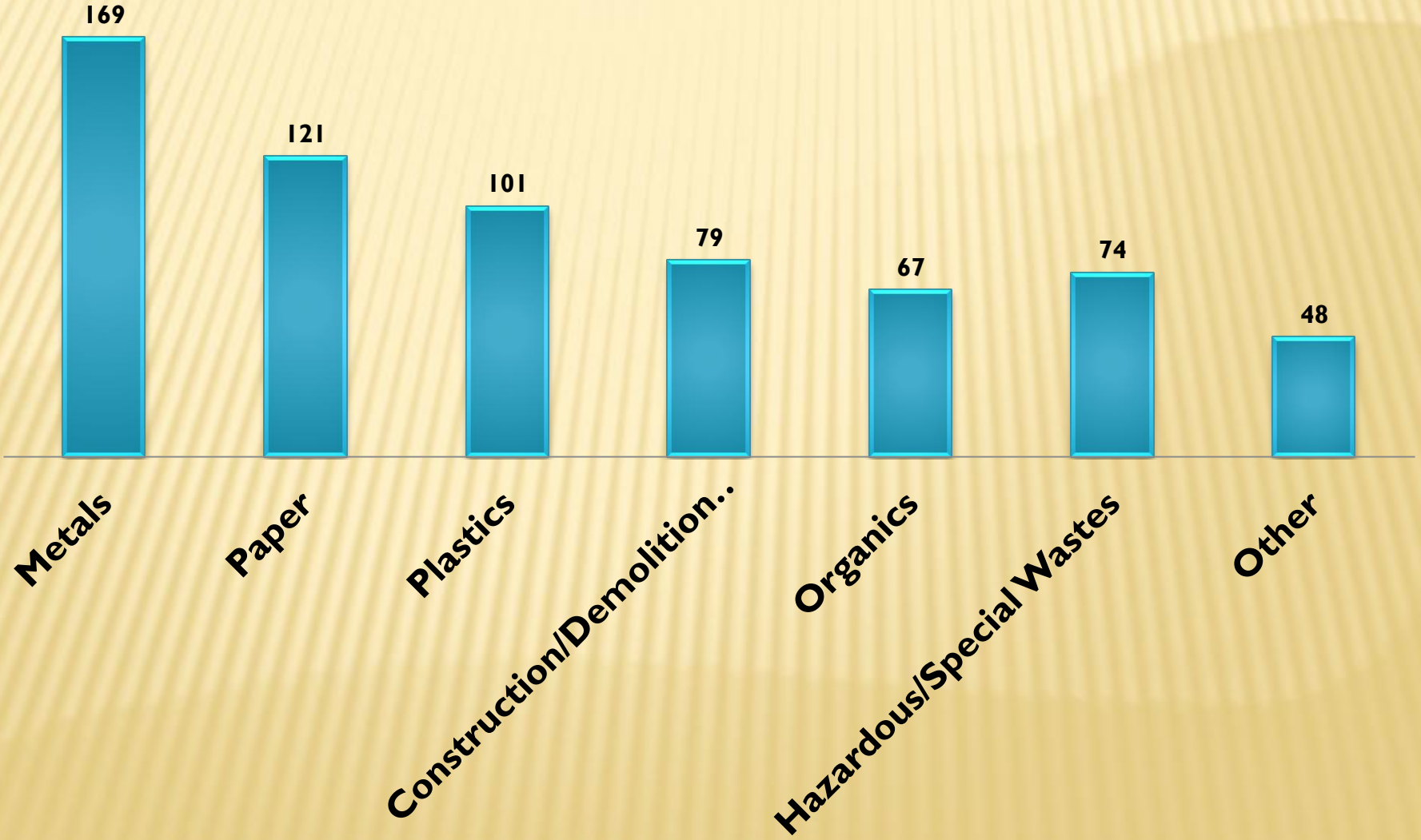
# RDUS SURVEY METHOD

- Online, voluntary, anonymous
- Facilities reporting or receiving recycled material from Washington in 2012
  - Attempted to contact 729 facilities
  - Actually contacted 682
  - 341 completed responses
  - 50% response rate
- Facilities provided information on material received, contamination and residual rates, and final use of that material by type

# WHAT TYPE OF FACILITY ARE YOU?



# DID YOUR FACILITY HANDLE ANY OF THE FOLLOWING MATERIALS FOR RECYCLING OR DIVERSION IN 2012 (CHECK ALL THAT APPLY)?

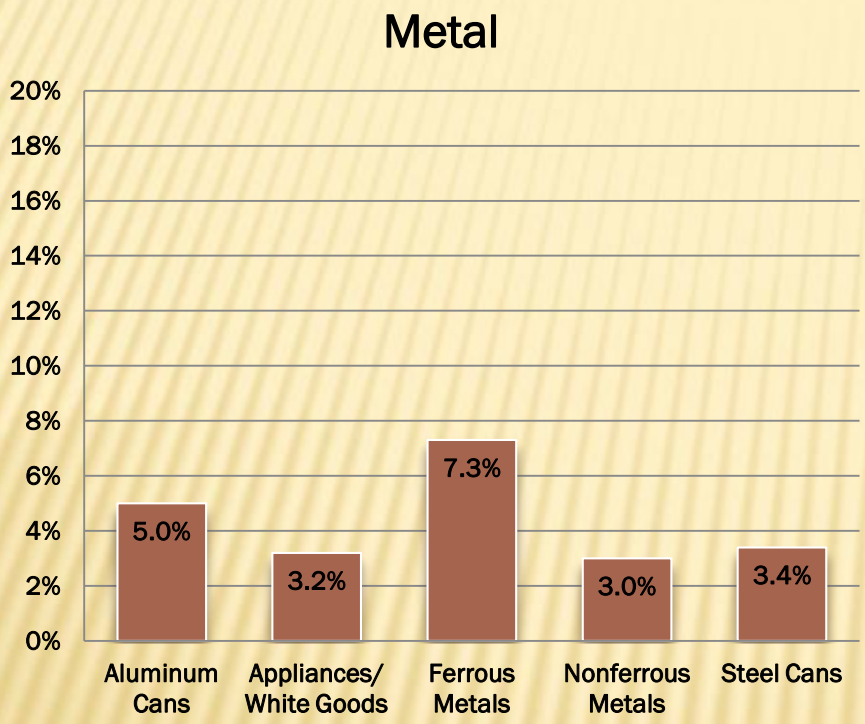


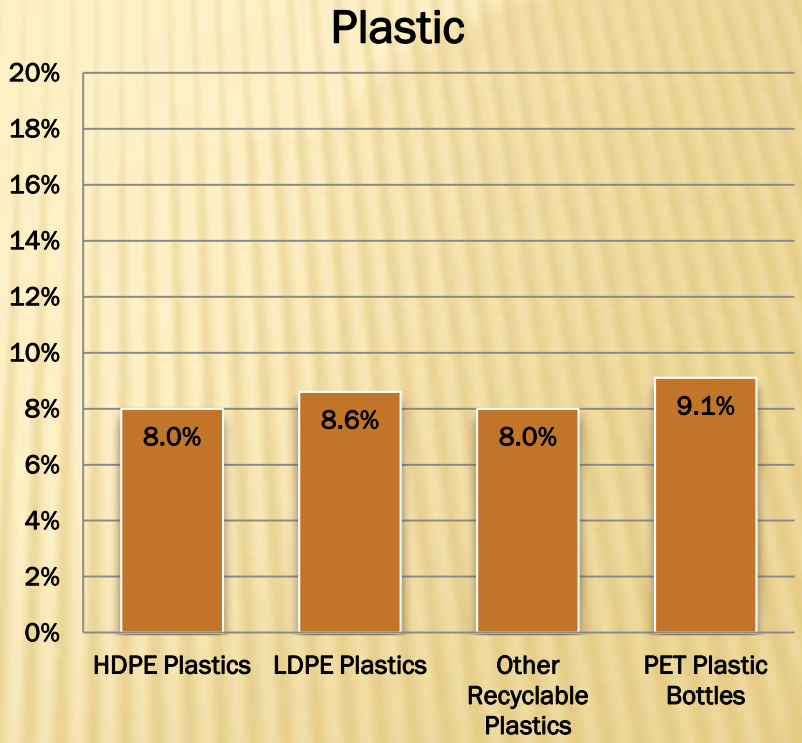
# SURVEY QUESTIONS ON LOSS RATES

**You checked Aluminum Cans. Please complete the following (if applicable):**

| | |
|---|---|
| Incoming contamination rate in loose or baled material (%). | |
| Residual rate for sorting (% of total incoming ultimately sent to landfill or incinerator for disposal, if different than Incoming contamination.) | |
| Amount of the contamination or residuals that went through the recycling process or was sent to recycling markets (if known.) | |


# OVERALL LOSS RATES- SURVEY



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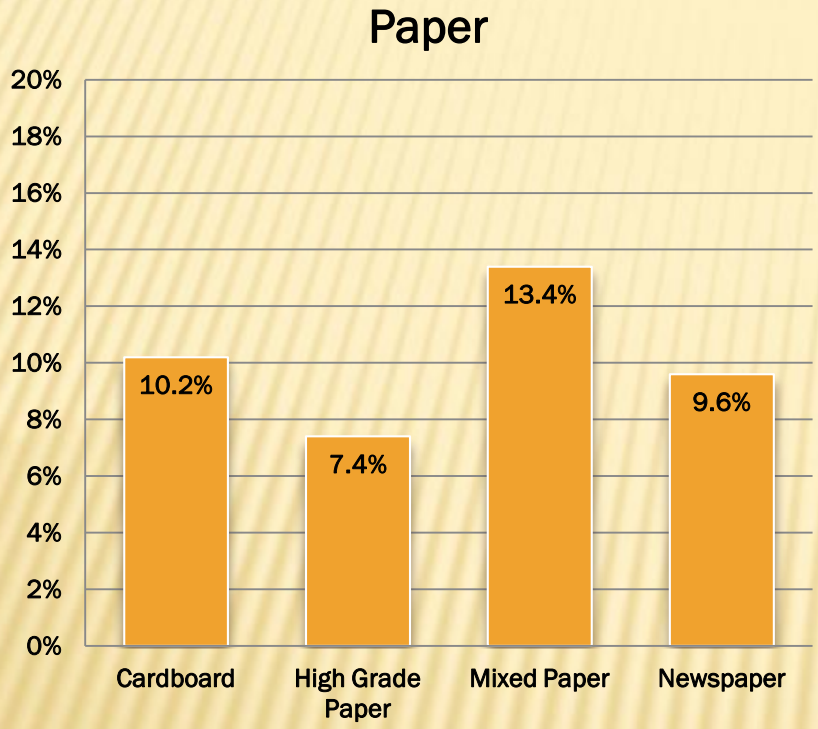
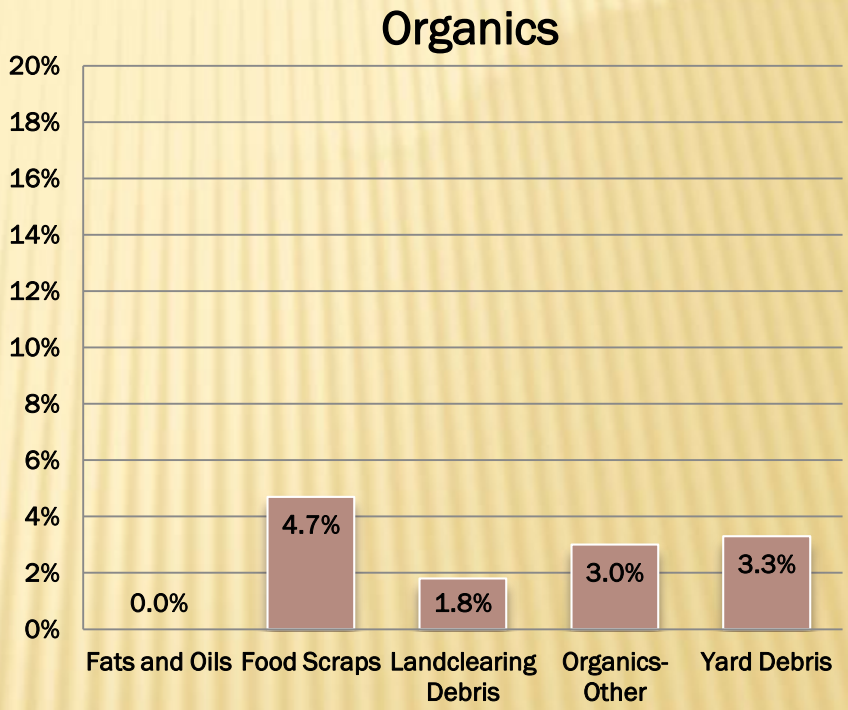
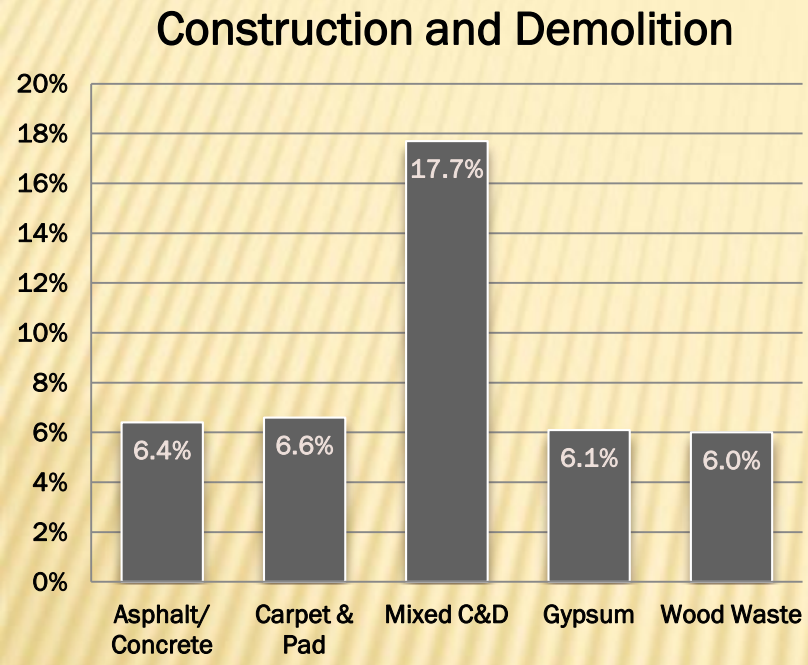


# OVERALL LOSS RATES- SURVEY




# SURVEY QUESTIONS PERTAINING TO DESTINATION AND USE OF MATERIALS

**Aluminum Cans**

Percent (%) of the recovered material that was sent to or used for the fol ving:

| | Enter 1-10 (Fill in short des tion) | Product or material produced (Fill in short description) |
|---|---|---|
| Reused | 2% | |
| Recycled in-house | 5% | |
| Sent to another domestic recycler, mill, broker, or end-user | 94% | |
| Exported outside US for intended recycling | 4% | |
| Energy markets (domestic) | <1% | |
| Landfill (domestic) | 1% | |
| Stockpiled for future use | <.1% | |
| Used in Manufacturing Process | <.1% | |
| Other | 0% | |

Total: 106%

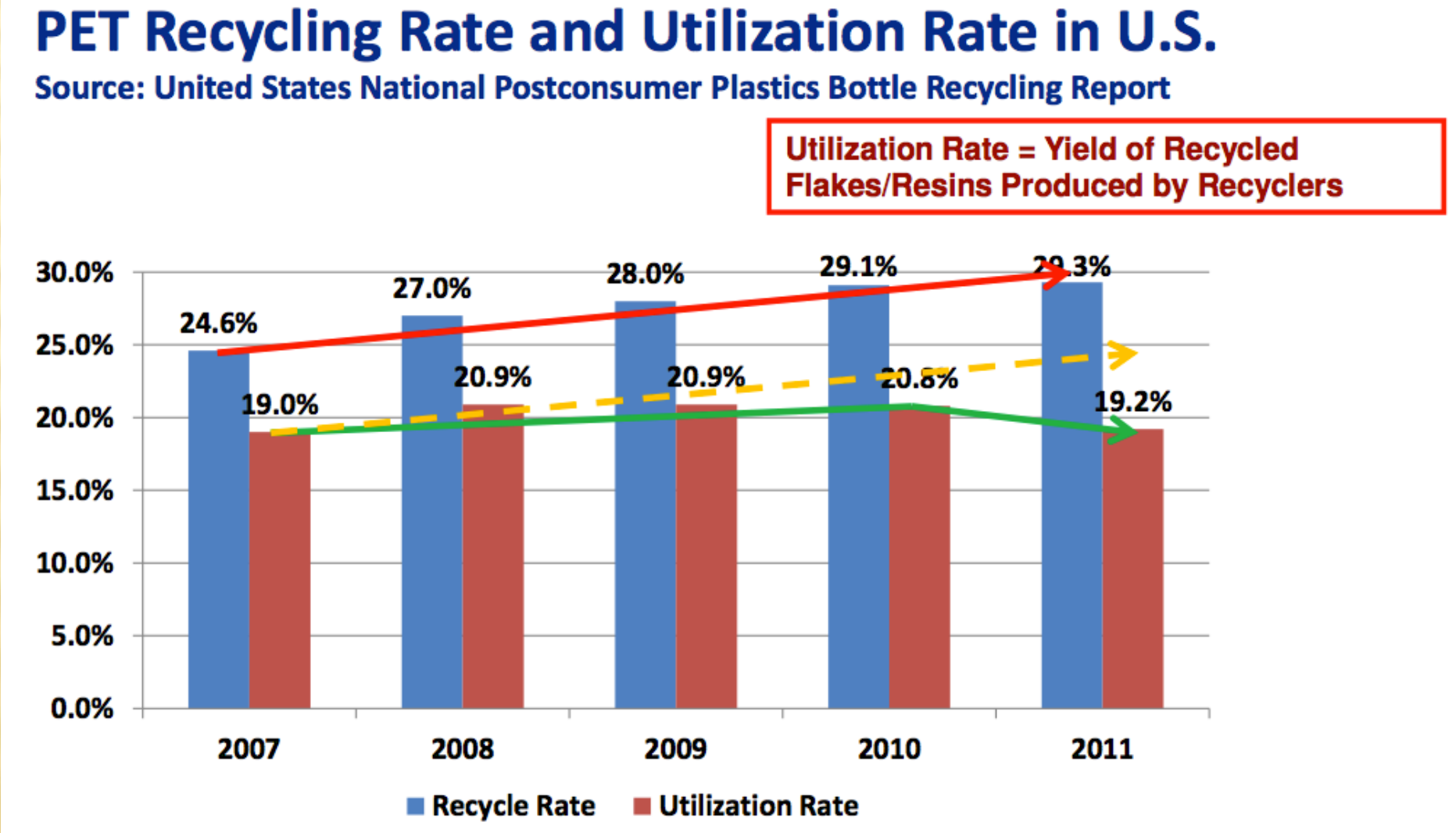
# PRODUCT OR MATERIAL PRODUCED: ALUMINUM

- 2% PET, All, All Metal, Alum Cans, Aluminum can manufacturer, aluminum cans, Aluminum Cans, Aluminum Cans, Aluminum cans, aluminum cans, Aluminum Cans, baled used beverage containers, BALES, can sheet, cans, cans, cans, cans, CANS, dirt, dirt, Dirt, Concrete, Wood, Green Waste, foodwaste, bags, Garbage, green waste, wood, concrete, metals, Hog Fuel, metal, metal, mill or ingot, MP NOT KNOWN, Paper, plastics, metals, PET Plastics, resold as yard art, TO BE REMELTED BY A MILL, UBC, UBC, UBC, unknown, unknown, Unknown, unknown, unknown.

# PLEASE PROVIDE US WITH ANY COMMENTS ON THE LEVEL OF CONFIDENCE YOU HAVE IN THE NUMBERS YOU HAVE PROVIDED IN THIS SURVEY.

- “(Our facility) prides itself on being a near 100% landfill diversion facility.  Please call if you have any questions.”
- “Not 100% confident I gave absolute accurate #'s in every category but did the best I could.”
- “I am so glad you asked!  These figures are educated guesses. There may be a margin of error of 20%”
- “100% confident in accuracy of numbers”
- “because landfill pricing is so high it is very important not to send to the landfill, and we track our waste cost very closely.”

# INDUSTRY DATA – PET UTILIZATION RATES



# INDUSTRY DATA: PET: FINAL PRODUCT

## PET: Final Product

- Fiber
- Food & Beverage Bottles
- Sheet & Film
- Strapping
- Non-Food Bottles
- Engineered Resin & Other

MOORE
RECYCLING ASSOCIATES INC.
*Recycling Implementation Specialists*

# ALTERNATIVE METHODS OF FINDING OUT WHAT WE WANT

- Incoming and Outgoing reports from facilities
- Facility audits
- Bale-break studies
- Track material further along in process (reports from mills, brokers, end-users)

# GHG BENEFITS OF RECYCLING & DIVERSION

- Washington's measured diversion efforts for 2012 reduced greenhouse gas emissions by about 2.6 million tons (MTCE) or 765 pounds per person.

- This is similar to removing 1.9 million passenger cars from the roadway each year - almost half of the passenger cars in Washington.
- It would take eliminating 52,000 railway cars of coal to prevent the same amount of GHG emissions.

# ENERGY SAVINGS FROM RECYCLING & DIVERSION

- The 8.0 million tons of material diverted from disposal in Washington in 2012 saved about 129 trillion BTUs of energy.

•This is equivalent to saving about a third of all energy used by Washington businesses annually.
•Or, it's enough to power 1.1 million homes for a year – nearly half the households in Washington.

# EPA WASTE REDUCTION MODEL (WARM)

- Created by EPA to help solid waste planners and organizations track and report GHG emissions reductions from several different waste management practices.
- Lifecycle view of 40 materials
- Available both as a Web-based calculator and as a Microsoft Excel spreadsheet.
- Updated June 2013

# USING WARM

- Calculates and totals GHG emissions and energy savings of baseline and alternative waste management practices.

| Tons Source Reduced | Tons Recycled | Tons Landfilled | Tons Combusted | Tons Composted |
|---|---|---|---|---|

- Calculates emissions in:
  - Metric tons of carbon equivalent (MTCE)
  - Metric tons of carbon dioxide equivalent (MTCO2E)
  - Energy units (million BTU)

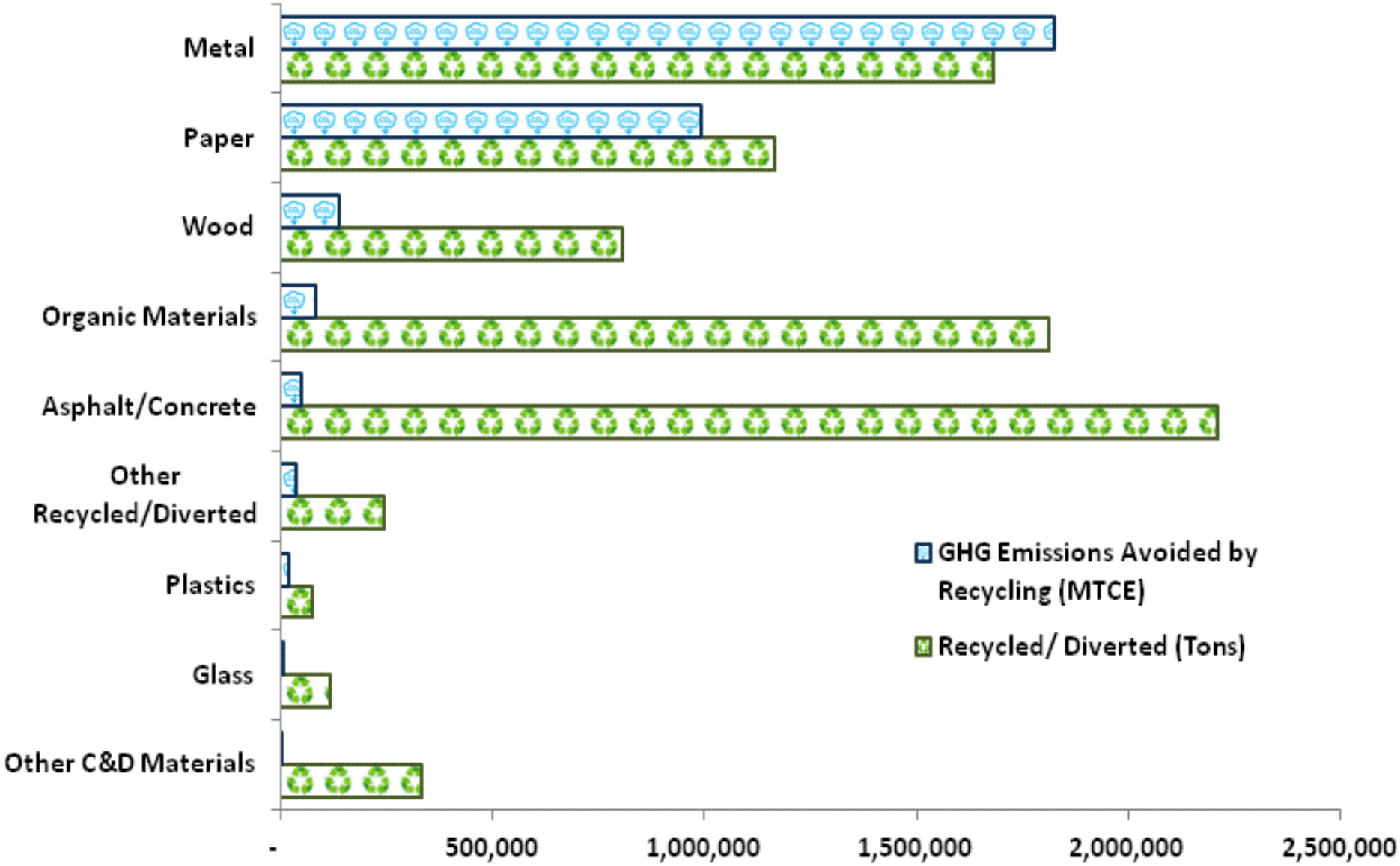
# MATERIAL TYPES RECOGNIZED BY WARM

| | | |
|---|---|---|
| Aluminum Cans | Grass | Office Paper |
| Aluminium Ingot | HDPE | Personal Computers |
| Asphalt Concrete | LDPE | PET |
| Asphalt Shingles | Leaves | Phonebooks |
| Branches | LLDPE | PLA |
| Carpet | Magazines / Third-Class Mail | PP |
| Clay Bricks | Medium-density Fiberboard | PS |
| Concrete | Mixed Metals | PVC |
| Copper Wire | Mixed MSW | Steel Cans |
| Corrugated Cardboard | Mixed Organics | Textbooks |
| Dimensional Lumber | Mixed Paper (general) | Tires |
| Drywall | Mixed Paper (primarily from offices) | Vinyl Flooring |
| Fiberglass Insulation | Mixed Paper (primarily residential) | Wood Flooring |
| Fly Ash | Mixed Plastics | Yard Trimmings |
| Food Scraps | Mixed Recyclables | |
| Glass | Newspaper | |

# SOME LIMITATIONS OF WARM:

- All recycling is treated as closed-loop.
- Doesn't track some materials such as textiles, household items or other products.
- Rolls all future emissions into a single number.
- Treats all production as domestic.

# Recycled/Diverted Materials and GHG Emissions Savings in Washington (2011)



# OTHER QUESTIONS?